CONTENTS OF VOLUME 391

October 1987

JONES D.A. & RUTHERFORD O.M. Human muscle strength training: the effects of three different regimes and the nature of the resultant changes. 1

CASEY K., DUFFIN J., KELSEY C.J. & MCAVOY G.V. The effect of treadmill speed on ventilation at the start of exercise in man. 13

DAVIES Alison M. & ECCLES R. Electromyographic responses of a nasal muscle to stimulation of the nasal vestibule in the cat. 25

GALLEGO R., IVORRA I. & MORALES A. Effects of central or peripheral axotomy on membrane properties of sensory neurones in the petrosal ganglion of the cat. 39

LUNG Mary A. & WANG James C.C. Arterial supply, venous drainage and collateral circulation in the nose of the anaesthetized dog. 57

BERARDELLI A., DAY B.L., MARSDEN C.D. & ROTHWELL J.C. Evidence favouring presynaptic inhibition between antagonist muscle afferents in the human forearm. 71

BENOIT Evelyne & DUBOIS Jean-Marc Interactions of guanidinium ions with sodium channels in frog myelinated nerve fibre. 85

EISNER D.A., ELLIOTT A.C. & SMITH G.L. The contribution of intracellular acidosis to the decline of developed pressure in ferret hearts exposed to cyanide. 99

FIEKERS Jerome F., NEEL Darcy S. & PARSONS Rodney L. Acceleration of desensitization by agonist pre-treatment in the snake. 109

CAPOVILLA M., HARE W.A. & OWEN W.G. Voltage gain of signal transfer from retinal rods to bipolar cells in the tiger salamander. 125

Go Vay Liang W. & YAKSH Tony L. Release of substance P from the cat spinal cord. 141

COHEN Neri M. & LEDERER W.J. Calcium current in isolated neonatal rat ventricular myocytes. 169

JYVÄSJÄRVI E. & KNIFFKI K.-D. Cold stimulation of teeth: a comparison between the responses of cat intradental Aδ and C fibres and human sensation. 193

MORIMOTO Akio, MURAKAMI Naotoshi, TAKADA Mitsuaki, TESHIROGI Shyuichi & WATANABE Tatsuo Fever and acute phase response induced in rabbits by human recombinant interferon-γ. 209

AKAIKE N., INOMATA N. & TOKUTOMI N. Contribution of chloride shifts to the fade of γ-aminobutyric acid-gated currents in frog dorsal root ganglion cells. 219

CLARK R.B. & GILES W. Sodium current in single cells from bullfrog atrium: voltage dependence and ion transfer properties. 235

KAPLAN Ehud, PURPURA Keith & SHAPLEY Robert M. Contrast affects the transmission of visual information through the mammalian lateral geniculate nucleus. 267

ALTSCHULER S.M., DAVIES R.O. & PACK A.I. Role of medullary inspiratory neurones in the control of the diaphragm during oesophageal stimulation in cats. 289

NORTHMORE D.P.M. Neural activity in the regenerating optic nerve of the goldfish. 299

SPEDEN R.N. & WARREN D.M. Myogenic adaptation of rabbit ear arteries to pulsatile internal pressures. 313

AICKIN C. Claire, BRADING Alison F. & WALMSLEY D. An investigation of sodium–calcium exchange in the smooth muscle of guinea-pig ureter. 325

HODGKIN A.L., MCNAUGHTON P.A. & NUNN B.J. Measurement of sodium–calcium exchange in salamander rods. 347

HODGKIN A.L. & NUNN B.J. The effect of ions on sodium–calcium exchange in salamander rods. 371

GOLDEN F.ST.C. & TIPTON M.J. Human thermal responses during leg-only exercise in cold water. 399

LOTE C.J., MCVICAR A.J. & THEWLES A. Renal haemodynamic actions of pressor doses of lysine vasopressin in the rat. 407

GEURSEN A. & GRIGOR M.R. Serum albumin secretion in rat milk. 419

BURD P.F. & FERRY C.B. A prolonged contraction at the end-plate region of the diaphragm of rats and mice after anticholinesterases *in vitro*. 429

BLOOM S.R., EDWARDS A.V. & JONES C.T. Adrenal cortical responses to vasoactive intestinal peptide in conscious hypophysectomized calves. 441

HUFSCHMIDT Andreas & SCHWALLER Ingrid Short-range elasticity and resting tension of relaxed human lower leg muscles. 451

MARUYAMA Yoshio A patch-clamp study of mammalian platelets and their voltage-gated potassium current. 467

LUND E.K. & SMITH M.W. Rat jejunal disaccharidase activity increases biphasically during early post-natal development. 487

SALT T.E. Excitatory amino acid receptors and synaptic transmission in the rat ventrobasal thalamus. 499

KHALIL Zeinab, LIVETT Bruce G. & MARLEY Philip D. Sensory fibres modulate histamine-induced catecholamine secretion from the rat adrenal medulla and sympathetic nerves. 511

MITCHELL M.R., POWELL T., TERRAR D.A. & TWIST V.W. Electrical activity and contraction in cells isolated from rat and guinea-pig ventricular muscle: a comparative study. 527

MITCHELL M.R., POWELL T., TERRAR D.A. & TWIST V.W. Cardiac-activated inward current and contraction in rat and guinea-pig ventricular myocytes 545

ANDREASSEN Steen & ARENDT-NIELSEN Lars Muscle fibre conduction velocity in motor units of the human anterior tibial muscle: a new size principle parameter. 561

PERES Antonio The calcium current of mouse egg measured in physiological calcium and temperature conditions. 573

CODY Frederick W.J., GOODWIN Carmen N. & RICHARDSON Helen C. Effects of ischaemia upon reflex electromyographic responses evoked by stretch and vibration in human wrist flexor muscles. 589

FINDLAY Ian The effects of magnesium upon adenosine triphosphate-sensitive potassium channels in a rat insulin-secreting cell line. 611

CHIU S.Y. & SCHWARZ W. Sodium and potassium currents in acutely demyelinated internodes of rabbit sciatic nerves. 631

PROCEEDINGS OF THE PHYSIOLOGICAL SOCIETY

24–25 *April* 1987

Newcastle Meeting

DEMONSTRATIONS

Hollingworth S., Marshall M.W. & Robson E. Continuous stimulation of organ-cultured rat skeletal muscle. 2*P*

Byrne P.O., Eyre J.A., Kenyon B.R., Koh T.H.H.G., Miller S. & Oliver P.D. High-current discharge circuit for electromagnetic stimulation of the brain in man. 3*P*

Barker A.T., Eyre J.A., Kenyon B.R., Koh T.H.H.G., Miller S. & Wraith J. Blocking of transmission of stimulus-related electrical interference to inputs of high-gain a.c. preamplifiers used for neurophysiological measurement. 4*P*

Bradley P.M., Burns B. Delisle & Webb A.C. Chick forebrain slices: correlation between electrophysiological observations and anatomical studies. 5*P*

Burns B. Delisle, Ebenezer I.S. & Webb A.C. Methods for making simultaneous and continuous records of the effects of drugs upon neural activity in the cerebral cortex and the diameter of pial blood vessels in rats anaesthetized with urethane. 6*P*

Boakes R.J., Burns B. Delisle & Webb A.C. Some useful properties of *in vitro* slices from the rat's forebrain. 7*P*

Greenwell J.R. & Robinson C.J. An interactive computer program to demonstrate the major factors in the design and execution of graded-dose bioassays. 8*P*

Benns S.E., Canfield S.P. & Curwain B.P. Preparation of purified parietal cells from rat using Nycodenz density gradients. 9*P*

Gillespie J.I. & Greenwell J.R. Measurement of intracellular pH in single isolated cells using fluorescent dyes. 10*P*

Henigman F., Kordaš M. & Zorec R. An inexpensive head stage for the 'patch-clamp' apparatus. 11*P*

Fawcett P.R.W., Schofield I.S., Slater C.R. & Walls T.J. Structure and function of the neuromuscular junction in human neuromuscular disease. 12*P*

Eastham E.J. & Hirst B.H. Assessment of sugar absorption and small-intestinal transit time by breath hydrogen measurement in medical students.] 13*P*

Gascoigne W.K., McBurney R.N. & Moore W. Apparatus for rapidly imaging fluorescence and luminescence signals from individual cells containing optically active molecules. 14*P*

McBurney R.N., Moore J. & Smith S.M. A multiway tap for use with a U-tube tool. 15*P*

Goodall R.M. & Sanders D.J. An implementation of a hippocampal neurone model on the BBC microcomputer linked to a 32-bit coprocessor (Acorn). 16*P*

Greenwell J.R. On-line analysis and recording of the voltage response to current injection in single microelectrode measurements of intracellular potential using the BBC microcomputer. 16*P*

COMMUNICATIONS

Griffiths Nina M. & Simmons N.L. The distribution of [^{3}H]bumetanide binding in rabbit kidneys *in vitro*. 17*P*

Simons T.J.B. Ca-dependent Zn efflux from human red blood cells. 18*P*

Cavieres J.D. & Reynolds C.J. Biphasic Ca^{2+} effect on the ATP–ADP exchange catalysed by the Ca^{2+} pump of human red cells. 19*P*

Gillespie J.I. & Segar Claire J. Changes in the numbers of high-affinity ouabain binding sites on murine neuroblastoma cells. 20*P*

Levin R.J. & Scargill Margaret Role of bicarbonate and chloride ions in rat endometrial electrogenic secretory activity. 21*P*

Flemström G., Granstam S.-O. & Nylander O. Bicarbonate secretion by duodenum in the rabbit *in vivo*. 22P

Fändriks L., Sjövall H. & Jönson C. Reflex activation of the sympatho-adrenergic system decreases duodenal HCO_3^- secretion in the rat. 23P

Case R.M., Lau K.R. & Yates A.J. Evidence for Na/H and Cl/HCO_3 exchange in the isolated, perfused rabbit mandibular salivary gland. 24P

Bund S.J., Heagerty A.M., Izzard A.S. & Swales J.D. Amiloride-induced relaxation of human resistance arterioles: evidence for a central role of Na^+/H^+ exchange in sustained smooth muscle contraction. 25P

Hirst B.H. & Wilkes J.M. Proton permeability and membrane fluidity of rabbit duodenal brush-border membrane vesicles. 26P

Bunce K.T. & Spraggs C.F. Characterization of the Na^+/Cl^- co-transport process involved in chloride secretion in guinea-pig gastric mucosa. 27P

Giraldez F., Sepúlveda F.V. & Sheppard D.N. Cyclic AMP activates apical Cl conductance in *Necturus* enterocytes *in vitro*. 28P

Jodal M., Lundgren O. & Naftalin R.J. Changes *in vivo* in rat ileal fluid uptake and mucosal volume induced by changes in the tonicity of the luminal perfusion fluid. 29P

Hutson D., Scratcherd T. & Sorial E.A. The transport of lactate and pyruvate into the pancreatic juice of isolated perfused cat pancreas. 30P

Emery P.W., Mann G.E. & Norman P.S.R. Selectivity of amino acid exchange mechanisms at the basolateral border of the epithelium in the isolated perfused rat pancreas. 31P

Hatta Y., Kanno T., Mann G.E. & Tanaka S. Effects of insulin, phorbol ester and carbachol on amino acid uptake and amylase secretion in isolated rat pancreatic lobules. 32P

Argent B.E., Gray M.A. & Greenwell J.R. Secretin-regulated anion channel on the apical membrane of rat pancreatic duct cells *in vitro*. 33P

Candy J.M., Edwardson J.A., Faircloth R., Keith A.B., Morris C.M. & Pullen R.G.L. 6^7Gallium as a potential marker for aluminium transport in rat brain. 34P

Higgs, N.B., Lees, M., Tonge A., Turnberg L.A. & Warhurst G. Phorbol esters inhibit the secretion provoked by prostaglandin E_2 in a colonic epithelial cell line. 35P

Allen A., Garner A., Hunter A.C. & Keogh J.P. Measurement of gastric mucus biosynthesis and secretion in the rat and frog. 36P

Case R.M., Howorth A.J. & Padfield P.J. Analysis by high-performance liquid chromatography of proteins secreted by rabbit mandibular salivary gland following stimulation with acetylcholine and isoproterenol. 37P

Forte Trudy M., Nichols Alex V., Selmek-Halsey Janet & Shore Virgie G. Lipid-poor apolipoprotein A1 secreted by the human hepatoma cell line, Hep G2: a model for extracellular formation of model precursor high-density lipoproteins. 38P

Derrington A.M. Amplitude-modulated gratings mask the responses of X-cells in cat LGN to gratings of the modulation frequency. 39P

Boakes R.J. & Harris J.B. Excitation of cerebellar Purkinje cells in slices of jolting mouse brain. 40P

Kenyon B.R., Miller S. & Plant R.D. Short-latency inhibitory reflexes evoked between muscles of the shoulder in normal human subjects. 41P

Headley P.M., Ivorra M.I., Parsons C.G. & West D.C. The effects of several general anaesthetics on nociceptive spinal reflexes of the rat. 42P

Alford Simon & Williams Thelma L. Evidence for GABA-mediated inhibition of motoneurones during fictive locomotion in the isolated spinal cord of the lamprey. 43P

Boyett M.R., Kirby M.S. & Orchard C.H. Beat-to-beat changes in the calcium current (i_{Ca}) during calcium overload in mammalian ventricular myocytes. 44P

Harding D.P. Non-mitochondrial Ca^{2+} exchange in isolated rat ventricular myocytes. 45P

Garlick P.B., Di Marzo V., Mashiter G.D. & Tippins J.R. Leukotriene synthesis and release by isolated perfused rat hearts. 46P

Criddle D.N., Higgins A.J. & Woodward B. Effects of palmitylcarnitine on the isolated rat heart and thoracic aorta. 47P

Hamilton D.L. & Orchard C.H. The effect of acidosis on the relationship between Ca^{2+} and force in isolated ferret cardiac muscle. 48P

Cole R.S. & Fry C.H. Contractile responses of isolated human ureteric smooth muscle to extracellular pH changes. 49P

Iravani M.M. & Zar M.A. Effect of frequency of stimulation on neurogenic responses of isolated rat epididymal vas deferens. 50*P*

McVicar A.J. Effect of glucose loading on the renal response to 0·45% saline infusion in the rat. 51*P*

Dirami G. & Taylor W. Androgenic effects of a synthetic progestin (medroxyprogesterone acetate) on mouse kidney. 52*P*

Balment R.J., Hazon N. & Perrott M.N. Effects of papaverine on blood pressure and drinking rates in the lesser spotted dogfish *Scyliorhinus canicula*. 53*P*

Birchall J.P., Green G.G.R. & Porter D.W.F. Large departures from Weber's law in hearing of man. 54*P*

Barker D., Berry R.B. & Scott J.J.A. Recovery of cat muscle spindles in orthotopic muscle grafts. 55*P*

Banks R.W. Responses to small-amplitude sinusoidal stretching of cat peroneus brevis muscle spindles reinnervated after nerve section. 56*P*

Al-Amood W.S. & Lewis D.M. Response of fast- and slow twitch-muscles to two methods of denervation in rat. 57*P*

Grubb B.D., Harris J.B., McIver Margaret & Schofield I. Neuromuscular transmission at new neuromuscular junctions in rat regenerating skeletal muscle fibres. 58*P*

Jaros E. & McHanwell S. A monoclonal antibody that recognises a cell-surface antigen of neural crest-derived glial cells in the chick. 59*P*

Slater C.R. Persistence of synaptic acetylcholine receptors following degeneration of rat soleus muscle fibres. 60*P*

Olver R.E., Ramsden C.A. & Walters D.V. The effect of dibutyryl cyclic AMP on lung liquid volume flow across the pulmonary epithelium of the fetal sheep. 61*P*

Aitken J.C., McDermid G. & Thompson J. The effect of respiratory alkalosis and acidosis on the respiratory exchange ratio in man. 62*P*

Claiborne J.B. & Swenson E.R. Effects of gill carbonic anhydrase (CA) inhibition on recovery from respiratory and metabolic acidosis in the dogfish, *Squalus acanthias*. 63*P*

Nye P.C.G. & Paterson D.J. The effect of hyperkalaemia on the activity of pulmonary stretch receptors in the cat. 64*P*

Aftab N., Chinn D.J., Cotes J.E. & Smith S.L. Effect of ambient temperature on small-airway function in man. 65*P*

Douglas A.R., Jones N.L. & Reed J.W. CO_2 content of whole blood. 66*P*

Crisp A.J., Hainsworth R. & Tutt S.M. Respiratory responses to right-ventricular pressure changes in anaesthetized dogs. 67*P*

Barton S., Karpinski E. & Schachter M. Synthetic competitive antagonists of bradykinin on vasodilator responses in the cat and rabbit. 68*P*

Allen A., Bennett M.K., Leonard A.J. & Sellers L.A. Pepsin and ethanol damage: two different mechanisms of response by the rat gastric mucosa. 69*P*

Ward J.P.T. Cardiac muscle magnesium regulation during chronic dietary potassium depletion in rabbits. 70*P*

Daniel H., Fett C., Lucas M.L. & McEwan G.T.A. The effect of *E. coli* STa enterotoxin on the pH profile of villi in rat small intestine *in vitro*. 71*P*

Beshir S.O., Hall Judith, Osman O.M. & Robinson C.J. Vitamin D metabolism during Vitamin D_2 administration in man. 72*P*

Birchall J.P., FitzGerald J.E., Green G.G.R. & Pearson J.P. The structure of mucus glycoprotein isolated from the human middle ear. 73*P*

Kehl S.J. A high-threshold non-inactivating calcium current in isolated rat melanotrophs *in vitro*. 74*P*

Kim Y.I. & Neher E. Antibodies of Lambert-Eaton myasthenic syndrome block voltage-dependent calcium channels in isolated bovine adrenal chromaffin cells. 75*P*

Machen T.E. & Negulescu P.A. Release and reloading of intracellular calcium stores following cholinergic stimulation of isolated rabbit gastric parietal cells. 76*P*

Southerton J.S. & Weston A.H. Some effects of Ca^{2+}- and K^+-channel-blocking agents on responses to BRL 34915 and pinacidil in the rat isolated portal vein. 77*P*

Rang H.P. & Ritchie J.M. Activation of protein kinase C causes a depolarization of the rat isolated vagus nerve associated with increased sodium conductance. 78*P*

Szatkowski M.S. & Thomas R.C. Procaine and 4-aminopyridine increase both pH_i and intracellular buffering power in snail neurones. 79*P*

Hughes D., Kehl S.J. & McBurney R.N. Patch-clamp analysis of the intrinsic membrane properties of adult rat melanotrophs maintained *in vitro*. 80*P*

Smith S.M. The effects of strychnine and bicuculline on caesium-activated chloride currents in rat cultured spinal cord neurones. 81*P*

Gillette R. & McCrohan C.R. Enhancement of cyclic AMP-stimulated Na^+ current by the convulsant drug pentylenetetrazol in identified neurones of *Lymnaea stagnalis*. 82*P*

Cameron N.E., Cotter Mary & Robertson Sharon Effects of insulin and aldose reductase inhibitor treatment on contractile properties of rat skeletal muscles with long-term experimental diabetes. 83*P*

Burchill Susan A., Thody A.J. & Virden R. Effect of α-melanocyte stimulating hormone (α-MSH) on tyrosinase synthesis and activity in mouse hair follicular melanocytes. 84*P*

Marr A.P., Knight N.F., Sanders D.J., Venables C.W. & Zahedi S. Possible vagal control of enteroglucagon release in man. 85*P*

Fowler W.S., Higuchi T. & Neil D.M. Different fibre types revealed in a crustacean muscle using histochemical and electrophysiological techniques. 86*P*

Chouhdary Rukhsana, Neil D.M. & Rowlerson Anthea Fibre types in the extra-ocular muscles of the dogfish. 87*P*

Altringham J.D. & Johnston I.A. The mechanical properties of isolated polyneuronally innervated teleost (*Myoxocephalus scorpius*) fast muscle fibres. 88*P*

Hollingworth S., Marshall M.W. & Robson E. Absence of tetracaine-sensitive charge components in rat isolated skeletal muscle. 89*P*

Baylor S.M. & Hollingworth S. Effect of calcium (Ca) buffering by Fura2 on the second component of the intrinsic birefringence signal in frog isolated twitch muscle fibres. 90*P*

Bigland-Ritchie B. & Thomas C. Impulse propagation and muscle activation during prolonged human maximal contractions. 91*P*

Harmon Mary, Maughan R.J. & Nimmo Myra A. Human skeletal muscle adaptation to a 6-month endurance training programme. 92*P*

Gleeson M., Greenhaff P.L. & Maughan R.J. Diet, acid-base status and the metabolic response to exercise in man. 93*P*

Abul H., Davidson J., Milton A.S. & Rotondo D. The effect of pyrogens and antipyretics on blood prostaglandin E_2 levels in the rabbit. 94*P*

Milton A.S. & Rotondo D. The effects of pyrogens on phospholipase A_2 (PLA_2) activity in the rabbit. 95*P*

Collis C.S. Effect of temperature on melanophores of the teleost *Sarotherodon spilurus in vitro*. 96*P*

Bull Judith S., Clark R.G., Grundy D. & Scratcherd T. Pre-pyloric control of gastric motility. 97*P*

POSTER COMMUNICATIONS

Egan Christine, Rennie M.J. & Taylor P.M. Glutamine transport across the blood-facing membrane of perfused rat jejunum. 98*P*

Canfield S.P. Bicarbonate secretion by rat caecum *in vitro*. 99*P*

Augeron Chantal, Popowicz P. & Simmons N.L. Bumetanide inhibition of ouabain-insensitive $^{86}Rb(K)$ transport in a cultured human colonic adenocarcinoma cell-line (HT29 cl. 19A). 100*P*

Butcher P.A., Olver R.E., Steele L.W. & Ward M.R. Transport of sodium into apical membrane vesicles prepared from fetal sheep alveolar type II cells. 101*P*

McGiven J.D. & Moule S.K. Stimulation of Na^+/H^+ antiport in plasma membrane vesicles from rat liver perfused with dibutyryl cyclic AMP. 102*P*

Dray A., Forster P.L. & Perkins M.N. Bradykinin stimulates ion transport in rat isolated colon epithelium by a biphasic neural and non-neural mechanism. 103*P*

Case R.M., Garner A. & Padfield P.J. Pancreatic electrolyte and amylase secretion in the anaesthetized guinea-pig stimulated with either secretin, cholecystokinin octapeptide (CCK-8) or bombesin. 104*P*

Arkle S., Michalek R. & Templeton D. Quin2 fluorescence measurements in rat parotid acinar suspensions. 105*P*

Bing R.F., Brand S.C. & Dunk C.R. Noradrenaline uptake by human red blood cell ghosts. 106*P*

Atherton J.C. & Hutchinson C. Renal haemodynamics during pregnancy in the conscious rat. 107*P*

Atherton J.C. & Hutchinson C. Renal function in conscious New Zealand genetically hypertensive rats. 108*P*

Hanson M.A., Hughes S.M., Kumar P., Nijhuis J.G. & Wilson E.J. The effects of exercise on the pulsatility index in the femoral, carotid and brachial arteries in man. 109*P*

Gilbert W.M., Hanson M.A., McCooke H.B. & Nijhuis J.G. Changes in the pulsatility index of the femoral artery of the lamb after close intra-arterial administration of vasoactive drugs. 110*P*

Brooks Penelope A. & Stone T.W. Depression of carbachol responses by purines in the rat hippocampal slice. 111*P*

Iravani M.M., McDermott J.R., Turner J.D. & Zar M.A. Occurrence and distribution of neuropeptide Y (NPY)-immunoreactive nerves in rat isolated anococcygeus, and the effect of NPY on the inhibitory transmission. 112*P*

Amann R., Dray A. & Hankins M.W. Non-cholinergic transmission in the guinea-pig inferior mesenteric ganglion (IMG) *in vitro* mediates a viscero-visceral reflex. 113*P*

Barker D. & Saed H.H. Adrenergic innervation of rat jaw muscles. 114*P*

Johnston I.A. & Mutungi G. Effects of pH on shortening velocity and tension development in skinned muscle fibres from the cod, *Gadus morhua* L. 115*P*

Buanes T., Grotmol T., Landsverk T. & Ræder M.G. Effect of arterial P_{CO_2} (P_{a,CO_2}) on secretin-dependent biliary HCO_3^- secretion (J_{HCO_3}) and the cytoplasmic vesicle population in bile duct cells in pigs. 116*P*

Buanes T., Grotmol T., Landsverk T. & Ræder M.G. Effect of carbon dioxide on pancreatic $NaHCO_3$ secretion and pancreatic duct cell ultrastructure in anaesthetized pigs. 117*P*